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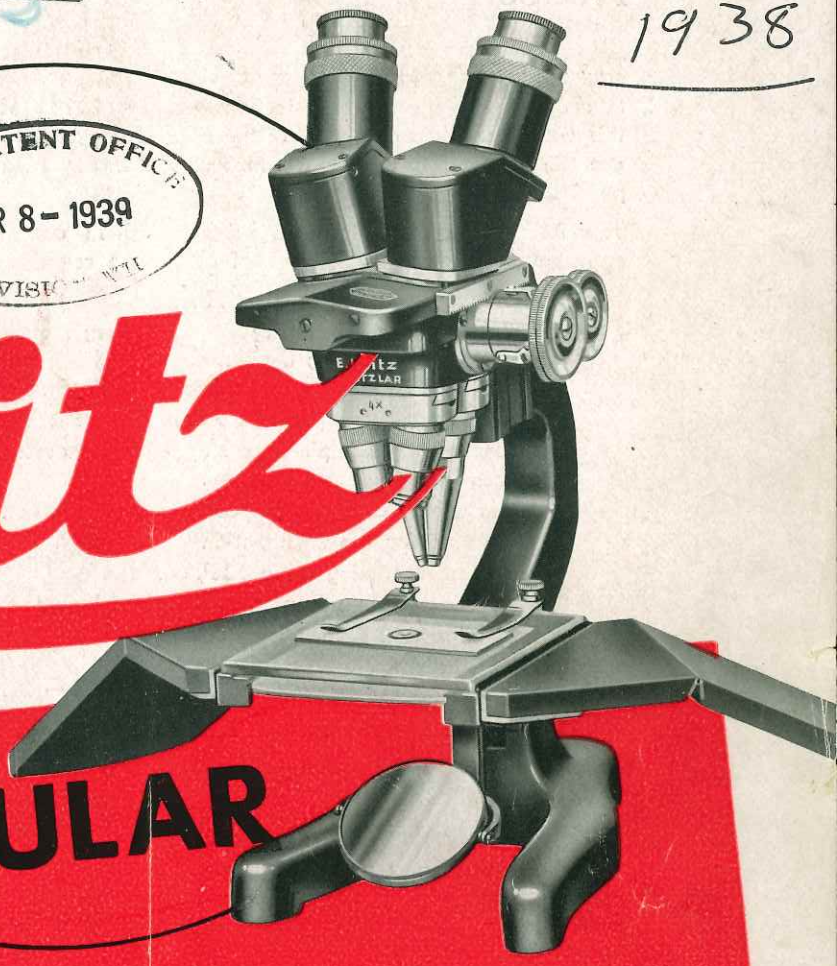


BINOCULAR PRISM MAGNIFIERS and MICROSCOPES

WITH WIDE FIELD OF VIEW

E. LEITZ, INC., NEW YORK

359/376

Notice

This list supersedes all previous issues.

In order to avoid confusion kindly make use of the codewords and numbers in this catalogue when ordering. In the case of telegraphic orders, it is sufficient to use the appropriate codeword which should in any case be appended whenever possible.

The following catalogues have been issued in connection with our various apparatus, and are supplied free of charge on request:

1. Microscopes, catalogue No. VI-A.
2. Metallurgical Microscopes, lists 52 B 1, en; Metallo B No. 7231 a; Material Testing Microscopes; Appliances for the Preparation of Metallurgical Specimens; Dilatometers; Toolmakers' Microscope.
3. Polarising Microscopes and Accessories, list V-B.
4. Dissecting and Simple-Lens Magnifiers, Binocular Prism Magnifiers, catalogues 53 C. I en and 53 C. II en.
5. Microscope Accessories, special lists on request.
6. Apparatus for the examination of Blood.
7. Microtomes, catalogue No. 53 F, en.
8. Photomicrographic Apparatus Panphot, bulletin Nos. 24 and 25.
9. Projection and Drawing Apparatus.
10. Leifo Photometer.
11. Prism Binocular Field Glasses and Opera Glasses.
12. "Leica" Miniature Camera, Enlargers and Small Projectors.
13. Range finders for photographic and technical purposes.

Electros of the illustrations in our catalogues can be had on loan in the original sizes, or in smaller sizes as available.

The **illustrations** in this catalogue are **not binding** in every detail, as we are constantly embodying improvements in our instruments towards their further perfection.

Introductory Notes

For many years the Leitz Works have contributed materially to the development and manufacture of binocular magnifiers and stereo-binocular microscopes.

In this connection we may mention the introduction of the Eilhard-Schulze binocular hand magnifier, and the numerous models of Greenough binocular dissecting microscopes. Considerable progress was achieved in the design and construction of binocular magnifiers when, in 1919, the Leitz Works first designed and manufactured the image-erecting binocular prism magnifier on lines similar to those of an existing instrument for a specific purpose. Because of its outstanding optical performance, this instrument was warmly received by all scientific workers. Since that time, countles scientists and technologists have come to appreciate the advantages embodied in this novel design. All those who use the instrument for the first time are enthusiastic about the very large field of view and the long working distance. The binocular prism magnifier — obtained by incorporating an image-erecting prism system in the ordinary magnifier — is certainly a "magnifier" in regard to the magnification obtained but in make-up it is actually a compound microscope with objectives and eyepieces. By the selection of a comparatively long focus for the objectives, it has been possible to obtain working distances which are extremely convenient for all practical work, the figures being 14 cm ($5^1/_2$″) for the low-power magnifier body, and 8 cm ($3^1/_8$″) for the high-power magnifier body. In magnifying power and size of field it is the first link in the chain of our stereoscopic instruments, the next being our Greenough microscope. This latter instrument has also been greatly improved in recent years, both as regards the magnifications attainable in either direction and the size of the field of view, while images of very high quality are obtained by the introduction of highly corrected objectives of increased N. A. A series of special stands designed over a period of years make the binocular prism magnifier and the stereo-binocular microscope accessible for all kinds of microscopic work.

Wetzlar, October 1938.

Ernst Leitz

Features and Advantages of the Prism Magnifiers and Stereo-Microscopes

The advantages of our instruments for binocular microscopy, etc. may be stated briefly as follows:

1. **They enable both eyes to be used.**
2. **They do not strain or tire the eyes, even after long periods of work.**
3. **They make the optical image much more realistic.**
4. **They present objects in their natural relief.**

These advantages are so well known and appreciated that our binocular prism magnifiers and stereo-microscopes are being used in almost every branch of science and technology. These instruments are indispensable wherever — apart from these advantages — it is necessary to combine the qualities of a **large field of view** with a **long working distance,** and at the same time to obtain **clear definition right up to the edge of the field** when working with either incident or transmitted light.

An additional feature of these instruments is that the objects and the various manipulative movements are seen the right way round as with ordinary vision, and not inverted as they are in monocular instruments. This is a great advantage when dissecting or handling material under observation.

As regards range of magnifications, free working distance and size of the field of view, our binocular instruments for stereoscopic viewing may be grouped as follows:

(1) Binocular Prism Magnifiers for magnifications ranging from $3^1/_2\times$ to $14\times$ and $10\times$ to $40\times$ respectively.

(2) Stereo-binocular Microscopes for magnifications ranging from $3.75\times$ to $216\times$.

In all these instruments paired objectives are used. In the prism magnifiers these paired objectives form an integral part of the instrument, the magnification being varied solely by changing the eyepieces. In the stereo-binocular microscopes the wider range of total magnifications is obtained by a combined interchange of objectives and eyepieces. The tables on pages 8, 20 and 33 give full particulars of the optical data concerning the instruments described in this list. It should be added that, to meet the requirements of those who wish to use a certain range of magnifications at frequent intervals, we have designed a stereo-binocular microscope provided with a changing slide for easily and rapidly varying the magnification (pages 11, 22, 25 and 30).

The wide range of applications of which both groups of instruments are capable has prompted us to introduce, in addition to the special instruments themselves, a large number of stands designed to meet very fully the special requirements of particular methods of investigation. Since the same optical components are often needed for use on different stands, we have dispensed with the necessity for duplicate sets by devising slide fittings for the ready interchange of the binocular bodies with their optical equipments as well as for the rack-and-pinion fittings. In every case the initial equipment of an instrument should accordingly comprise a stand, an interchangeable rack-and-pinion fitting, and an interchangeable binocular body with optical components.

This primary equipment may at any time be supplemented by the addition of other stands (without rack-and-pinion fitting, as specified in the catalogue).

The following is merely a rough outline of the wide scope of our binocular prism magnifiers and stereo-binocular microscopes:

Biology:

For the preparation and examination of specimens of every kind (zoological, entomological, botanical, etc.).

Medicine:

For the same purpose in anatomy, histology, embryology, pathology, etc.; in bacteriology for examining and treating plate cultures (Plate Culture Microscope); also in corneal microscopy, colposcopy, etc.

Geology, Mineralogy:

For viewing rock specimens (sections and prepared surfaces), fractures, ore products, etc. (Ore Dressing Microscope).

Metallography:

For the examination of metal surfaces (heat-treatment cracks), fractures (tensile tests), macro-structures, welds, enamelled objects, foundry moulding sand, etc.

Workshop Practice:

Control of the accuracy of tools, control of the precision of fine mechanisms, and for similar purposes in instrument making, etc.

Industrial Laboratories:

Food analysis, seed testing, manufacture of filament lamps, jewel and agate industry (Jewel-Bearing Microscope), paper and textile industries (Thread Counter), tanning industry, type foundry.

Forensic Technique:

Identification of forgeries, finger-prints, etc.

The utility of these instruments continually increases as their advantages become better known.

Binocular Prism Magnifier

with large field of view, for work at low and high magnifications, on interchangeable stands.

(See Figs. 1 to 11.)

The Binocular Prism Magnifier furnishes a highly corrected means of stereoscopically viewing objects situated at a long working distance and within a wide field of view.

Each of the two prism body-tubes carries an objective and eyepiece. Both tubes are capable of being turned about their optical axes, thus affording a ready means of adapting the eyepieces to the interpupillary distance of the observer over a range of 56 to 74 mm. Sharp focusing is effected by the rack-and-pinion focusing movement, while the left eyepiece is fitted with a focusing eye-lens to compensate for inequalities in the sight of the two eyes.*

The following parts are interchangeable: (1) the actual magnifier body; (2) the slide fitting with rack-and-pinion motion; (3) the long and short handles to suit the working distance of the magnifier when working at low and high magnifications; and (4) the foot. This interchangeability makes the instrument extremely versatile, and this feature is further enhanced by the provision of a wide selection of stands to meet the most varied requirements of scientific and technical work.

Each complete instrument is made up of the following components:

Stand (with object stage),
Rack-and-pinion motion for the body-tube (on slide fitting),
Tube or binocular body, with paired objectives and eyepieces.

The magnifier body for low magnifications is interchangeable with a similar one for high magnifications. By appropriate combinations the same instrument will accordingly give magnifications ranging from $3^1/_2\times$ to $40\times$. This involves an interchange of stands adapted for working distances of 79 and 144 mm respectively, and of the magnifier bodies.

s shown in the illustration in Fig. 1, page 13, the object stage takes the form of a brass foot with a removable glass plate. The brass foot may be replaced by a vulcanite foot (Fig. 12) for viewing any portion of an immovable object, on which it may be directly placed, or by a stage for transmitted light (Fig. 7).

* Normal-sighted persons or spectacle-wearers, when focusing, should see at the outset that the focusing eyepiece is in its zero position, as indicated by the inscribed circle on the cylindrical mount of the eye-lens. In the event of the definition differing in the two eyepieces, the image for the right eye should be first sharply focused with the rack-and-pinion motion, after which the left eyepiece should be focused for the left eye by sliding it, as is done with field-glasses.

The stand is provided with a handle and is connected to the stage by a bayonet joint. Its height is equivalent to the working distance of the magnifier, i. e. 144 and 79 mm respectively.

The stand has a dovetail carrying an interchangeable slide fitting with rack-and-pinion motion for the body-tube; it is secured in position by a clamping lever.

The interchangeable fitting has a similar dovetail slide for receiving the body-tube, which is also fixed by a clamping lever. The paired objectives are permanently mounted in the bodies, and are not interchangeable. The paired eyepieces **a 5, a 10, a 15 and a 20,** on the other hand, are designed for use on both magnifier bodies (see table below). The left eyepiece of each pair has a focusing eye-lens for compensating differences in the sight of the two eyes.

In combination with the 4 paired eyepieces, the low-power magnifier body yields magnifications from 3.5 × to 14 ×, whereas the high-power magnifier body yields magnifications from 10 × to 40 ×.

Low-Power Binocular Magnifier

Paired Eyepieces . . .	a 5	a 10	a 15	a 20
Magnification	3½ ×	7 ×	10½ ×	14 ×
Field of View, about . .	45 mm	30 mm	21 mm	13 mm
Working Distance, about	144 mm	144 mm	144 mm	144 mm
Codeword	**Lukul**	**Luken**	**Lukar**	**neelm**

High-Power Binocular Magnifier

Paired Eyepieces . . .	a 5	a 10	a 15	a 20
Magnification	10 ×	20 ×	30 ×	40 ×
Field of View, about . .	16 mm	11 mm	8 mm	4.5 mm
Working Distance, about	79 mm	79 mm	79 mm	79 mm
Codeword	**Lukul**	**Luken**	**Lukar**	**neelm**

Separate Parts for the Binocular Prism Magnifier

	Codeword
Case for accommodating one low-power binocular body with four pairs of eyepieces	**yacee**
Case for accommodating one high-power binocular body with four pairs of eyepieces	**ybeef**
Case for accommodating two binocular bodies for low and high magnifications, with four pairs of eyepieces . .	**Loras**
Cabinet for the low-power binocular magnifier with outfit ready for use as Fig. 1	**neeoa**
Cabinet for the high-power binocular magnifier with outfit ready for use as Fig. 3	**neepo**
Cabinet for the accommodation of two binocular magnifiers for low and high magnifications, with outfit ready for use	**neerp**
Cabinet for accommodating one low-power or one high-power binocular prism magnifier mounted on the stage for transmitted light, as Fig. 7	**Lufol**
Rubber eye-cups for placing on the pairs of eyepieces a 5 to a 20. Per pair	**neemz**

Measuring Devices for use with the Binocular Prism Magnifiers

(Measurements with the binocular prism magnifier can be made with one eye only. When viewing with both eyes, the measuring device must be removed from the eyepiece, as otherwise the quality of the image is impaired.)	
Micrometer for use with the Low-power Binocular Magnifier body	**neesc**
Each interval of the scale is equivalent to $^1/_{10}$ mm. The micrometer, supplied in a metal mount, is introduced into the eyepiece from underneath on the field-lens side, and is adapted for use with eyepieces **a 10** and **a 15.**	
Micrometer for use with the High-power Binocular Magnifier body	**neetq**
Each interval of the scale is equivalent to $^1/_{20}$ mm. This micrometer also can be used with eyepieces **a 10** and **a 15,** in the way described above.	
Device for measuring Angles with eyepieces **a 10** and **a 15** in conjunction with the high and low-power binocular magnifiers. The arrangement consists of a mounted graticule and graduated arc with index sleeve, together with paired eyepieces **a 10** or **a 15**	**neeqb**

Greenough Stereo-Binocular Microscope

with converging eyepieces and large field of view.

(See Figs. 12, 13, 16, 17, 20—23.)

Compared with previous models, we have substantially improved this instrument in the following particulars:

1. The eyepiece tubes have been increased in diameter, with a consequent increase in the fields of view by one-third of their original diameters.

2. By the addition of new objectives having initial magnifications of 0.75 × and 1 × respectively, the same low magnifications, large fields of view and long working distances can be obtained, such as were previously attainable only with the binocular magnifier.

3. By using an objective of 12 × initial power, it is now possible to obtain a magnification of 216 × in conjunction with a high-power eyepiece, whereas the magnification previously attainable was only 160 ×.

4. The apertures of the objectives have been increased, with a corresponding improvement in the brilliancy of the images. This means that the depth of focus obtaining provides more favorable conditions for viewing objects in solid relief.

5. By rotating the drums which contain the reversing prisms the two component images are made to fuse. This rotation covers a range of 54 to 76 mm. If this particular range does not cover the inter-pupillary distance of the observer's eyes, the fact should be stated in the order.

The microscope may be equipped with any of the nine different paired objectives having initial magnifications of 0.75 ×, 1 ×, 2 ×, 3 ×, 4 ×, 6 ×, 8 ×, 12 ×, 7 ×. The two paired objectives 0.75 × and 1 × are attached directly to the binocular tube of the microscope by their angular slides (see Fig. 13). The objectives 2 × to 12 × mounted on slides require for their attachment the use of the intermediate fitting supplied with the binocular tube (see Fig. 12).

The 7 × paired objectives are supplied for viewing small living organisms in water (Plankton examinations), their front lenses dipping into the water for this purpose.

Only four pairs of eyepieces are provided, their denominations and initial powers being G 5 ×, G 8 ×, G 12.5 × and G 18 ×. Eyepieces G 5 × should be used only with the two lowest objectives 0.75 × and 1 ×. Where it is specially desired to employ the standard Huyghens and periplanatic eyepieces with their whole range of magnifications, intermediate sleeves of standard diameter can be supplied to order. When such eyepieces are used, they yield smaller fields of view.

As a rule this microscope is furnished with an inclinable stand without fine adjustment, (Figs. 16 and 17, Codeword: "Grest"). The image is sharply focused by means of the rack-and-pinion motion of the interchangeable slide fitting.

For the examination of extensive objects, a special vulcanite foot with aluminium handle, (Fig. 12 Codeword "Greal"), can be supplied for the attachment of the binocular tube with its rack-and-pinion motion. This combination can also be supplied separately in the form of a "dermatoscope" (Fig. 12).

Stereo-Binocular Microscope

with converging eyepieces and large field of view, equipped with rapid changer for three pairs of objectives.

(See Figs. 14, 15, 18, 19 and 24.)

The heavy stand can be inclined through an angle of 45°. The large rectangular stage is equipped with hand rests, while the glass stage is made to withdraw.

Below the glass plate of the object stage there is a ground glass plate sliding in grooves. A celluloid plate is also supplied, having one side white and the other black, to act as a background when observing by incident light. It is slipped in between the stage and the ground glass plate. The equipment includes hand rests, a movable plane and concave mirror, rack-and-pinion focusing motion, and a rapid objective changer consisting of a sliding carriage fitted below the tubes. The change is effected by a rack-and-pinion motion.

The sliding carriage has a pair of 1× objectives permanently attached to it. Of the paired objectives 2×, 3×, 4×, 6×, 8×, 12× and the water-immersion objectives 7× any two can be attached by a slide to the plate in any desired combination, so that the instrument can be equipped with any of the following three pairs of objectives:

1×, 2×, 3×,
1×, 2×, 4×,
1×, 3×, 6×, etc.
up to 1×, 7×, 12×,

from which it will be seen that 21 combinations can be effected.

The tubes, with rapid objective changer and objectives, are attached to the interchangeable fitting by a dovetail slide and secured by a clamping lever. Owing to its interchangeability, the whole body with optical equipment can also be used on the pillar stands, or interchanged with the tubes fitted to these stands. By means of an interchangeable handle of special design (Figs. 14 and 15 Codeword: "nfeeu"), it can also be used with the brass foot (Codeword: "Lofox") or the vulcanite foot (Codeword: "Gregu", p. 22) to form a dermatoscope.

Stereo-Binocular Microscope

with parallel eyepieces and large field of view.

(See pages 33—34.)

This instrument differs from the preceding ones mainly by the parallel arrangement of the two eyepiece tubes. The advantage of this arrangement is that it prevents fatigue to the eyes in prolonged observations, since with most people, the axes of the eyes are parallel, or very nearly so, when relaxed. The parallel arrangement of the eyepieces in this form of microscope does not prevent the image from standing out in solid relief. Moreover, this instrument incorporates the various improvements which form the new features of the stereo-binocular microscopes with converging eyepiece tubes. All who are accustomed to microscopical examination without having to accommodate the eyes will no doubt prefer this instrument to one with converging eyepieces.

The microscope is supplied with any of the paired objectives of initial magnification 2×, 3×, 4×, 6×, 8×, 12×, and the water immersion objectives 7×.

The eyepieces used with this microscope are the wide diameter type with initial magnifications G 8×, G 12.5× and G 18×. Like the foregoing instrument, this one can, at the user's option, be used with the entire range of the normal Huyghens and periplanatic eyepieces. For this purpose we supply intermediate sleeves of standard diameter, which should be ordered as required. In this case, however, the user must forego the advantages of the large fields of view yielded by the wide eyepieces.

Dissecting Stands

for the interchangeable bodies of the Binocular Prism Magnifiers and the Stereo-Binocular Microscopes with converging and parallel eyepiece tubes.

(See Figs. 9—11 and 22—23.)

The following dissecting stands make it possible to use the Prism Magnifiers and the Stereo-Binocular Microscopes under the most varied conditions. The stands are adjustable for short and long working distances by a simple sliding movement; or they may be used with the long and short handles in the same way as the stage for transmitted light (Fig. 7).

The changing slide is the same for all stands, while in other respects the remarks on pages 6 and 7 also apply to these stands. Each complete instrument should comprise the following components:

Stand,
Rack-and-pinion motion for the body (on slide fitting),
Monocular or binocular tube with objectives and eyepieces.

The stands specified should accordingly be completed by the addition of a rack-and-pinion motion, a body-tube, and the optical components to suit particular requirements.

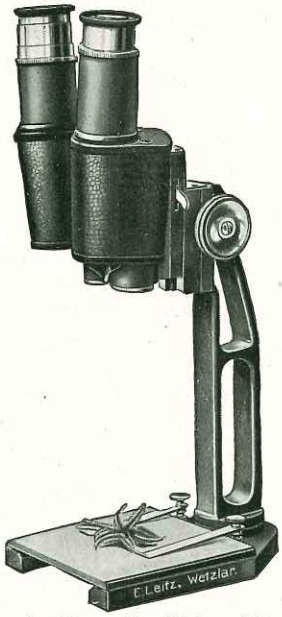


Fig. 1. Binocular Prism Magnifier BSM-B for low magnifications, on stand with brass foot and removable glass plate.

	Codeword
Low-power Binocular Magnifier Body	**Lubin**
Paired Eyepieces a 5, $3^1/_2\times$ . . .	**Lukul**
Paired Eyepieces a 10, $7\times$	**Luken**
Paired Eyepieces a 15, $10^1/_2\times$ . . .	**Lukar**
Interchangeable slide fitting with rack-and-pinion focusing motion	**Luzan**
Long interchangeable handle . . .	**Longa**
Brass Foot with removable glass plate	**Lofox**
Case* for the magnifier body and paired eyepieces	**yacee**
Complete Outfit	**Ludas**
* Instead of the case for the magnifier body alone, a cabinet can be supplied for accommodating the complete equipment ready for use (page 9)	**neeoa**

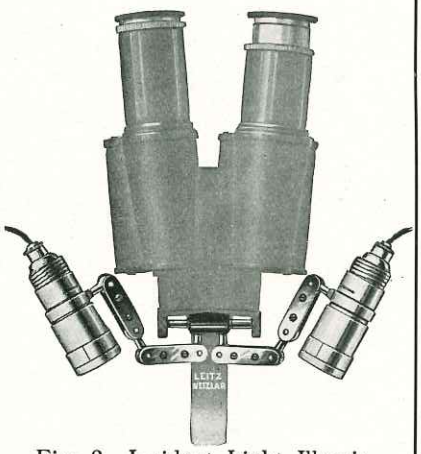


Fig. 2. Incident Light Illuminating Arrangement for the Prism Magnifier.

Incident Light Illuminating Arrangement, comprising 2 low voltage filament lamps 8 volts 0.6 amps. with converging lens, cord and daylight filter, with ball-jointed arm fitting the tube changing slide of the interchangeable rack-and-pinion motion .	**Liminlolig**
For above:	
Regulating Resistance with ammeter, for connecting the illuminating arrangement to 110/220 volts A. C. or D. C.	**Rekey**
Spare Bulb 8 volts 0.6 amps.	**Lisey**

	Codeword
High-power Binocular Magnifier Body	Lubos
Paired Eyepieces a 5, 10 ×	Lukul
Paired Eyepieces a 10, 20 ×	Luken
Paired Eyepieces a 15, 30 ×	Lukar
Interchangeable slide fitting with rack-and-pinion focusing motion	Luzan
Short interchangeable handle	Logur
Brass Foot with removable glass plate	Lofox
Case* for the magnifier body and paired eyepieces	ybeef
Complete Outfit	Ludet
* Instead of the case for the magnifier body alone, a cabinet can be supplied for accommodating the complete equipment ready for use (page 9)	neepo

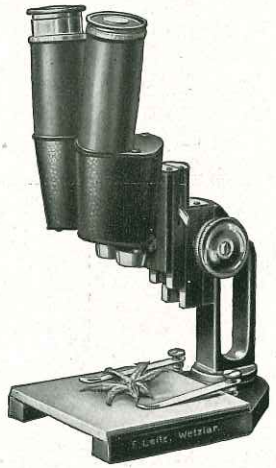


Fig. 3. High-power Binocular Prism Magnifier BSM-C with short handle on brass foot.

Incident Light Illuminating Arrangement, comprising one low voltage filament lamp 8 volts 0.6 amps., converging lens, cord and daylight filter, with ball-jointed arm fitting the tube changing slide of the interchangeable rack-and-pinion motion	Liminlolax
For above:	
Regulating Resistance with ammeter, for connecting the illuminating arrangement to 110/220 volts A. C. or D. C.	Rekey
Spare Bulb 8 volts 0.6 amps.	Lisey

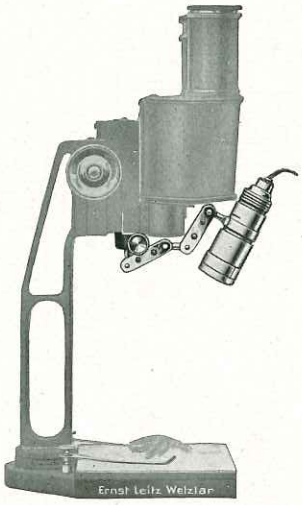


Fig. 4. Incident Light Illuminating Arrangement (single-lamp type) on Prism Magnifier.

Low-power Binocular Prism Magnifier

on new stand, for incident and transmitted light.

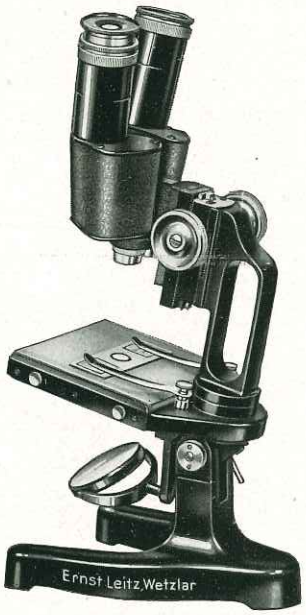


Fig. 5. Low-power Binocular Prism Magnifier on new inclinable stand.

	Codeword
Low-power Binocular Magnifier Body	Lubin
Paired Eyepieces a 5, $3^1/_2\times$	Lukul
Paired Eyepieces a 10, $7\times$	Luken
Paired Eyepieces a 15, $10^1/_2\times$	Lukar
Interchangeable slide fitting with rack-and-pinion focusing motion	Luzan
Long interchangeable handle	Longa
Heavy black-lacquered metal frame with removable glass plate, with a changing device on the upper and one on the lower part of the frame. Can be used both as a foot (for incident light) or, in conjunction with the microscope foot listed below, as an object stage (for transmitted light) (see Fig. 20)	yeeaz
Horseshoe type microscope foot, with joint, rotating and inclinable plane mirror, together with changing device for the attachment of the brass foot with removable glass plate (for transmitted light)	yeebn
Case * for the magnifier body and paired eyepieces . .	yacee
Complete Outfit	yeeca
* Instead of the case for the magnifier body alone, a cabinet can be supplied for accommodating the complete equipment ready for use	yceeu

High-power Binocular Prism Magnifier

on new stand, for incident and transmitted light.

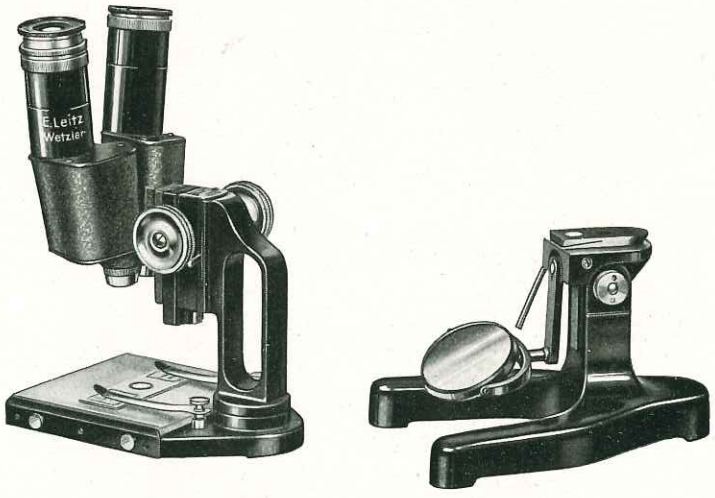


Fig. 6. High-power Binocular Prism Magnifier mounted on the object stage (which also acts as a foot) (Codeword: "yeeaz") of the new stand.

	Codeword
High-power Binocular Magnifier Body	Lubos
Paired Eyepieces a 5, 10 ×	Lukul
Paired Eyepieces a **10**, 20 ×	Luken
Paired Eyepieces a **15**, 30 ×	Lukar
Interchangeable slide fitting with rack-and-pinion focusing motion	Luzan
Short interchangeable handle	Logur
Heavy black-lacquered metal frame with removable glass plate, with a changing device on the upper and one on the lower part of the frame. Can be used both as a **foot** (for incident light) or, in conjunction with the microscope foot listed below, as an **object stage** (for transmitted light) (see Fig. 20)	yeeaz
Horseshoe type microscope foot, with joint, rotating and inclinable plane mirror, together with changing device for the attachment of the brass foot with removable glass plate (for transmitted light)	yeebn
Case * for the magnifier body and paired eyepieces . .	ybeef
Complete Outfit	yeedo
* Instead of the case for the magnifier body alone, a cabinet can be supplied for accommodating the complete equipment ready for use	ycgee

Fig. 7. High-power Binocular Prism Magnifier on stage for transmitted light.

	Codeword
Low-power Binocular Magnifier Body	**Lubin**
Paired Eyepieces a 5, $3^1/_2\times$ . . .	**Lukul**
Paired Eyepieces a 10, $7\times$	**Luken**
Paired Eyepieces a 15, $10^1/_2\times$ . . .	**Lukar**
Interchangeable slide fitting with rack-and-pinion focusing motion	**Luzan**
Stage for examinations by transmitted light, with joint for tilting and heavy rectangular iron foot	**pamee**
Short interchangeable handle . . .	**Logur**
Case* for the magnifier body and paired eyepieces	**yacee**
Complete Outfit	**yeefp**
* Instead of the case for the magnifier body alone, a cabinet can be supplied for accommodating the complete equipment ready for use (page 9)	**Lufol**

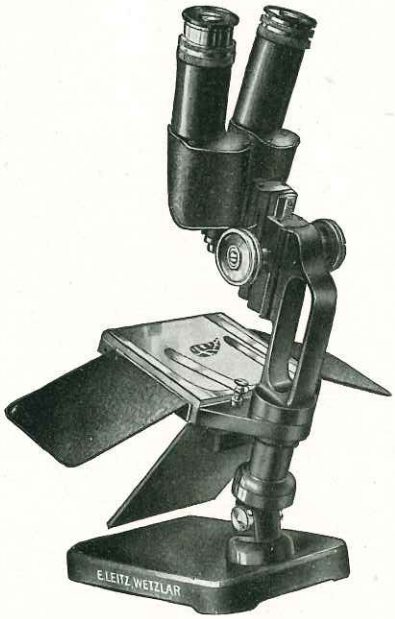


Fig. 8. High-power Binocular Prism Magnifier on interchangeable stage for transmitted light.

High-power Binocular Magnifier Body	**Lubos**
Paired Eyepieces a 5, $10\times$	**Lukul**
Paired Eyepieces a 10, $20\times$	**Luken**
Paired Eyepieces a 15, $30\times$	**Lukar**
Interchangeable slide fitting with rack-and-pinion focusing motion	**Luzan**
Stage for examinations by transmitted light	**Lotiz**
Foot-plate with tilting motion . . .	**Lokip**
Short interchangeable handle . . .	**Logur**
Case* for the magnifier body and paired eyepieces	**ybeef**
Complete Outfit	**yeeid**
* Instead of the case for the magnifier body alone, a cabinet can be supplied for accommodating the complete equipment ready for use	**yeegc**

Binocular Prism Magnifiers on Pillar Stands

	Codeword
Low-power Binocular Magnifier Body	Lubin
Paired Eyepieces a 5, $3^1/_2\times$.	Lukul
Paired Eyepieces a 10, $7\times$ . .	Luken
Paired Eyepieces a 15, $10^1/_2\times$.	Lukar
Interchangeable slide fitting with rack-and-pinion focusing motion	Luzan
Pillar Stand US I, horizontal bar rotating and vertically adjustable, and horizontally displaceable by rack-and-pinion motion	cmeet
Case for the magnifier body and paired eyepieces	yacee
Complete Outfit	yeehq

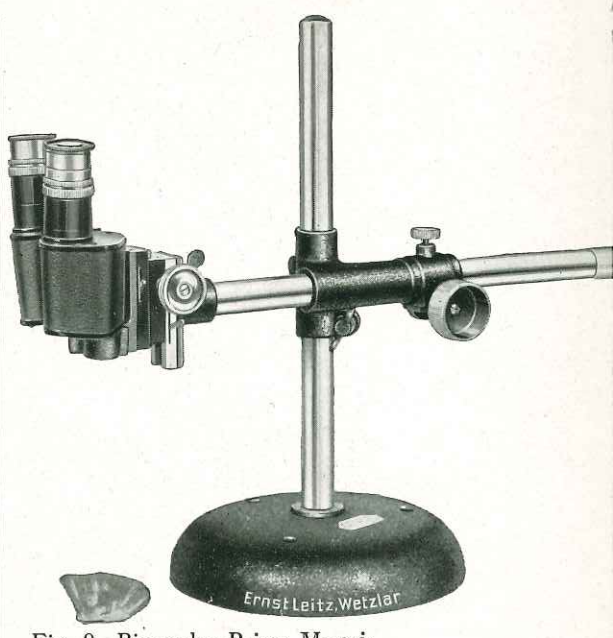


Fig. 9. Binocular Prism Magnifier on Pillar Stand US I.

High-power Binocular Magnifier Body	Lubos
Paired Eyepieces a 5, $10\times$ . .	Lukul
Paired Eyepieces a 10, $20\times$ . .	Luken
Paired Eyepieces a 15, $30\times$ . .	Lukar
Interchangeable slide fitting with rack-and-pinion focusing motion	Luzan
Pillar Stand BI-I with cross motion and double joint, on round iron base	Lurte
Case for the magnifier body and paired eyepieces	ybeef
Complete Outfit	yeems

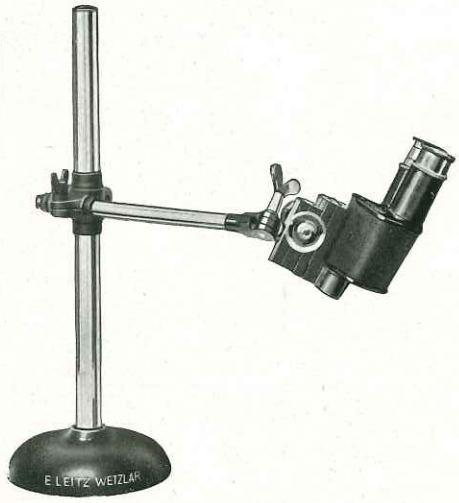


Fig. 10. Binocular Prism Magnifier on simple Pillar Stand BI-I Codeword "Lurte".

The following item is recommended for working with all Pillar Stands:

Hemispherical Stage for viewing opaque objects. Can be rotated and inclined in all directions. The nickel-plated hemisphere is attached to its socket by a rubber sucker, which should be moistened with soapy water before use. In the middle of the hemisphere is a second vertically adjustable rubber sucker for holding the objects. Dishes, etc. can easily be moved about on this sucker without becoming detached . . . . . Codeword **"Lugel"**.

Binocular Prism Magnifier on Cross Motion Stand UK III

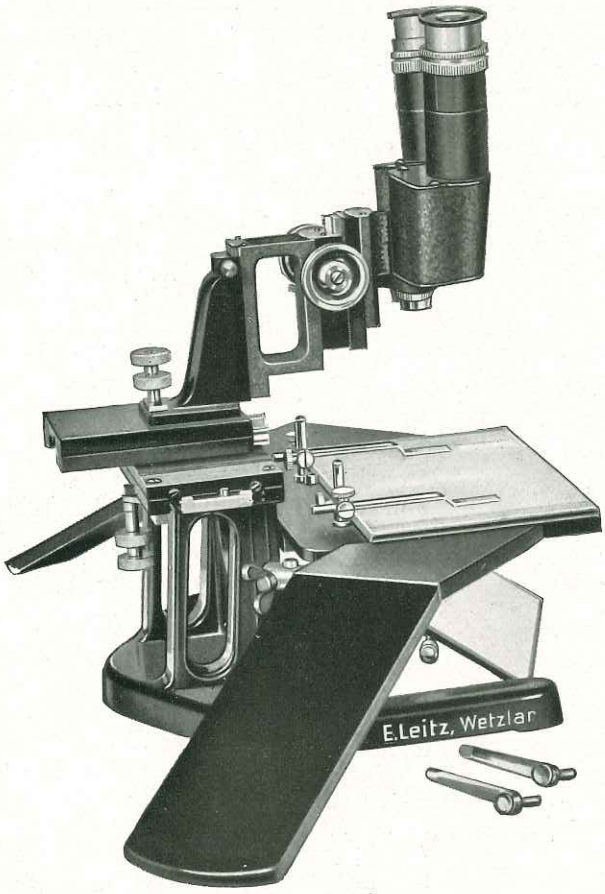


Fig. 11.
Stand UK III with High-power Magnifier Body for incident and transmitted light.

	Codeword
High-power Binocular Magnifier Body	**Lubos**
Paired Eyepieces a 5, 10 ×	**Lukul**
Paired Eyepieces a 10, 20 ×	**Luken**
Paired Eyepieces a 15, 30 ×	**Lukar**
Stand UK III with traversing range of 80 × 140 mm; with vertically adjustable square object stage with removable glass plate, and opal glass plate; together with adjustable plane mirror 110 × 160 mm, and two hand rests	**cheex**
Intermediate fitting with dovetail slide	**dytee**
Interchangeable slide fitting with rack-and-pinion focusing motion.	**Luzan**
Cabinet for accommodating the above	**cglee**
Complete Outfit	**yeekr**

Objectives and Eyepieces

for the Greenough Stereo-Binocular Microscope with converging eyepieces and large field of view.

Paired Objectives.

Notation and Initial Magnification	Focal Length mm	Free Working Distance mm	Micrometer value measured with G×12.5 and G×18	Codeword
0.75 ×	60.6	120	130 μ.	**ngeet**
1 ×	61.6	120	100 μ.	**nhcee**
2 ×	55	80	50 μ.	**nhees**
3 ×	46	60	33 μ.	**nkeeg**
4 ×	40	50	25 μ.	**nkgee**
6 ×	30	35	16.8 μ.	**nleep**
8 ×	25	26	13 μ.	**nliee**
12×	18	18	8.6 μ.	**nmeeo**
7 ×*	25	22	—	**nmlee**

* Paired Water Immersion Objectives for viewing small living organisms in water.

Paired Eyepieces with large field of view.

Notation and Magnification	G 5 ×	G 8 ×	G 12.5 ×	G 18 ×
Focal Length mm	50	31.25	20	13.88
Codeword	**noeem**	**npeel**	**npree**	**nqeek**

	Codeword
Where desired, the right or left eyepiece of the various pairs may be supplied with a focusing eye-lens, to allow for differences in the sight of the two eyes. Additional cost for each pair of eyepieces . .	**nqfee**
Eyepiece Micrometer, in mount, for placing in the eyepieces G 12.5 × or G 18 × . . . . . 10 mm = 100 divisions	**ygeeq**
5 mm = 100 divisions	**yheep**
10 mm = 200 divisions	**ymeel**

Table of Magnifications, Free Working Distances and Diameters of Field of View.

Paired Objectives	Free Working Distance mm	Paired Eyepieces G 5 × Magnif.	G 5 × Field of View mm	G 8 × Magnif.	G 8 × Field of View mm	G 12.5 × Magnif.	G 12.5 × Field of View mm	G 18 × Magnif.	G 18 × Field of View mm
0.75 ×	120	3.75	40	6	32	9.5	24	13.5	16
1 ×	120	5	30	8	24	12.5	18	18	12
2 ×	80	—	—	16	12	25	9	36	6
3 ×	60	—	—	24	8	38	6	54	4
4 ×	50	—	—	32	6	50	4.5	72	3
6 ×	35	—	—	48	4	75	3	108	2
8 ×	26	—	—	64	3	100	2.25	144	1.5
12 ×	18	—	—	96	2	150	1.5	216	1.0
7 ×	22	—	—	56	3.4	88	2.5	126	1.7

Greenough Stereo-Binocular Microscope, with simple equipment

for working with incident light (e. g., as a Dermatoscope).

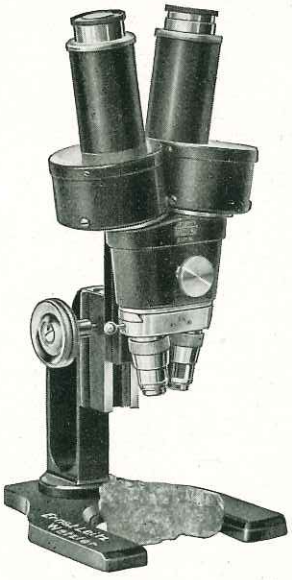


Fig. 12. Greenough Stereo-Binocular Microscope on vulcanite foot with aluminium handle.

	Codeword
Greenough Stereo-Binocular Body with detachable intermediate adapter for the paired objectives from 2× upwards, but without objectives or eyepieces	Green
Interchangeable slide fitting with rack-and-pinion focusing motion	Luzan
Vulcanite foot with aluminium handle	Greal
Case* for the binocular body	Greve
Outfit without optical components .	yeenf
* Instead of the case for the magnifier body alone, a cabinet can be supplied for accommodating the complete equipment ready for use	neevr

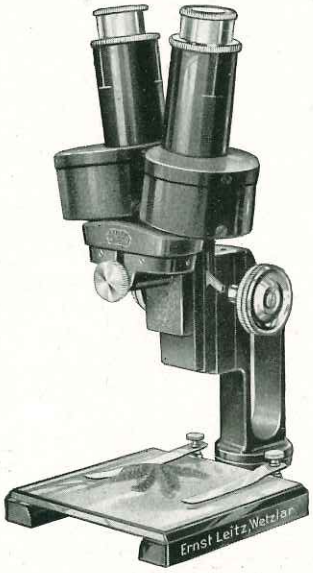


Fig. 13. Greenough Stereo-Binocular Microscope on brass foot.

Greenough Stereo-Binocular Body with detachable intermediate adapter for the paired objectives from 2× upwards, but exclusive of objectives or eyepieces	Green
Interchangeable slide fitting with rack-and-pinion focusing motion	Luzan
Brass Foot with removable glass plate	Lofox
Short interchangeable handle . . .	Logur
Case* for the binocular body	Greve
Outfit without optical components .	yeeot
* Instead of the case for the magnifier body alone, a cabinet can be supplied for accommodating the complete equipment ready for use	yhree

Greenough Stereo-Binocular Microscope

with rapid objective changer and very simple equipment, for working with incident light (e. g., as a Dermatoscope).

	Codeword
Greenough Stereo-Binocular Body with straight eyepiece tubes, and with rapid changing device for 3 pairs of objectives, including one pair of objectives permanently mounted in the changer movable by rack and pinion; without other paired objectives and eyepieces . . .	**neeky**
Interchangeable handle of special design as Fig. 14	**nfeeu**
Interchangeable slide fitting with rack-and-pinion focusing motion	**Luzan**
Brass Foot* with removable glass plate	**Lofox**
Cabinet	**nfyee**
Outfit without optical components	**yeepg**

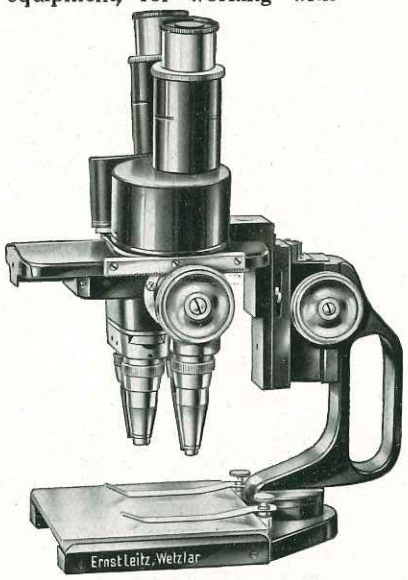


Fig. 14. Greenough Stereo-Binocular Microscope with rapid objective changer, on brass foot.

Greenough Stereo-Binocular Body with **inclined eyepiece tubes**, and with rapid changing device for 3 pairs of objectives, including one pair of objectives 1 ×, permanently mounted in the changer movable by rack and pinion; without other paired objectives and eyepieces . . .	**yeequ**
Interchangeable handle of special design as Fig. 15	**nfeeu**
Interchangeable slide fitting with rack-and-pinion focusing motion	**Luzan**
Brass Foot* with removable glass plate	**Lofox**
Cabinet	**yieeo**
Outfit without optical components	**yeeti**

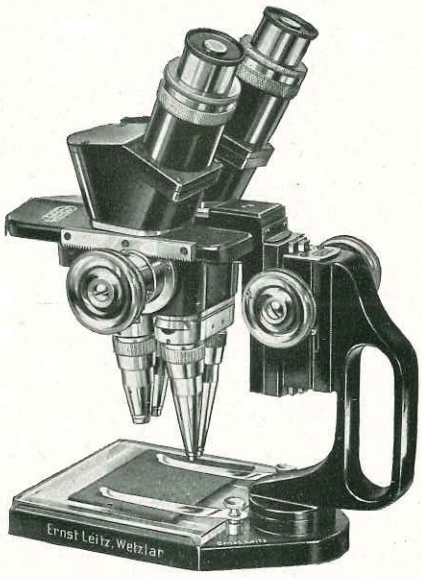


Fig. 15. Greenough Stereo-Binocular Microscope with rapid objective changer, on brass foot BI-A.

* In place of the brass foot, a vulcanite foot can be supplied for the interchangeable handle. Codeword: **Gregu.**

Greenough Stereo-Binocular Microscope

mounted on stand with inclination joint for working with incident and transmitted light.

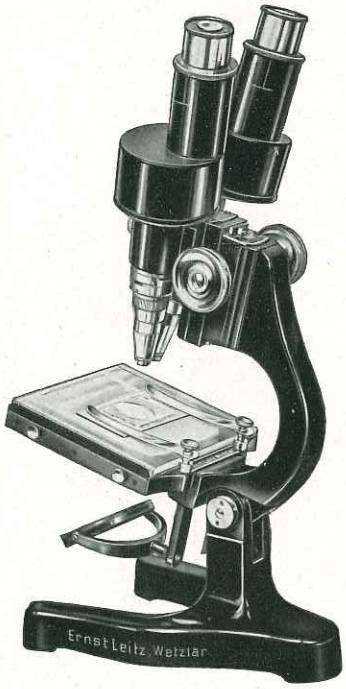


Fig. 16. Greenough Stereo-Binocular Microscope with straight eyepieces, on stand BI-M.

	Codeword
Greenough Stereo-Binocular Body with detachable intermediate adapter for the paired objectives from × 2 upwards, but without objectives or eyepieces	Green
Interchangeable slide fitting with rack-and-pinion focusing motion	Luzan
Microscope Stand with inclination joint, removable glass plate and ground glass and celluloid plates; two hand rests with supports, and movable plane and concave mirror	Grest
Fitted cabinet for accommodating the microscope . . .	neeud
Outfit without optical components	yeerh

Greenough Stereo-Binocular Microscope

with inclined eyepiece tubes, on stand with inclination joint for working with incident and transmitted light.

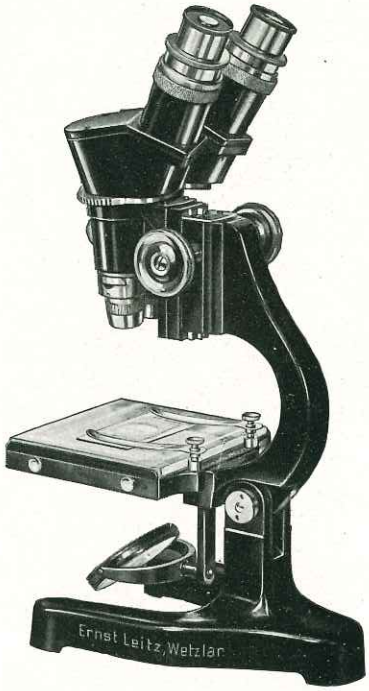


Fig. 17. Greenough Stereo-Binocular Microscope with inclined eyepieces, on stand BI-M.

	Codeword
Greenough Stereo-Binocular Body with inclined eyepiece tubes, and with detachable intermediate adapter for the paired objectives from 2× upwards, but without objectives or eyepieces	**yeesv**
Interchangeable slide fitting with rack-and-pinion focusing motion	**Luzan**
Microscope Stand with inclination joint, removable glass plate and ground glass and celluloid plates; two hand rests with supports, and movable plane and concave mirror	**Grest**
Fitted cabinet for accommodating the microscope . . .	**yitee**
Outfit without optical components	**yeevk**

Greenough Stereo-Binocular Microscope

with rapid objective changer and stand BI-Ma, for working with incident and transmitted light.

Fig. 18.

	Codeword
Greenough Stereo-Binocular Body with straight eyepieces, and with rapid changing device for 3 pairs of objectives, including one pair of objectives 1 × permanently mounted in the changer movable by rack and pinion; without other paired objectives and eyepieces	**neeky**
Interchangeable slide fitting with rack-and-pinion focusing motion	**Luzan**
Microscope Stand with inclination joint, and with removable glass plate and ground glass and celluloid plates; two hand rests with supports, and movable plane and concave mirror .	**neeyf**
Fitted cabinet for accommodating the microscope	**neezt**
Outfit without optical components . .	**nieer**

Greenough Stereo-Binocular Microscope

with inclined eyepieces and rapid objective changer, on stand BI-Ma, for working with incident and transmitted light.

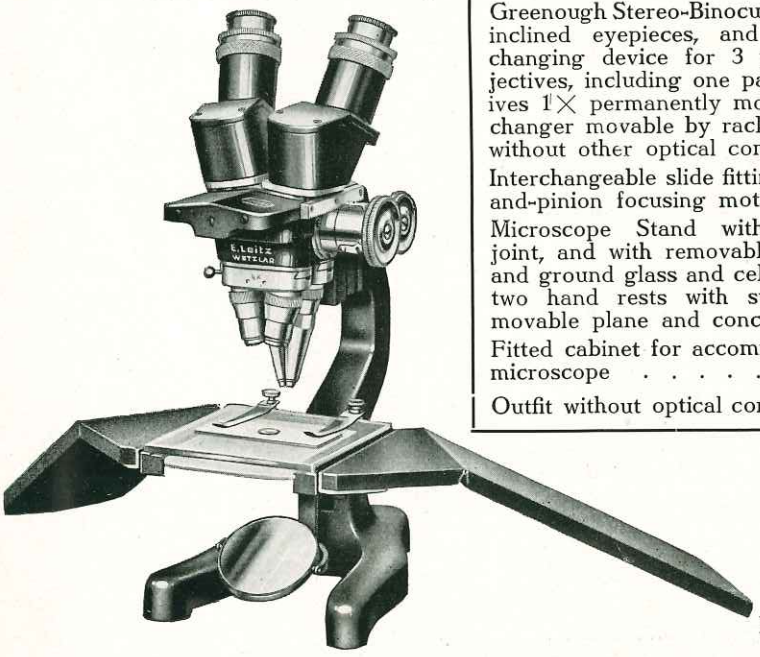


Fig. 19.

Greenough Stereo-Binocular Body with inclined eyepieces, and with rapid changing device for 3 pairs of objectives, including one pair of objectives 1 × permanently mounted in the changer movable by rack and pinion; without other optical components . .	**yeequ**
Interchangeable slide fitting with rack-and-pinion focusing motion	**Luzan**
Microscope Stand with inclination joint, and with removable glass plate and ground glass and celluloid plates; two hand rests with supports, and movable plane and concave mirror .	**neeyf**
Fitted cabinet for accommodating the microscope	**ykeen**
Outfit without optical components . .	**yeeuw**

Greenough Stereo-Binocular Microscope

on new stand, for working with incident and transmitted light.

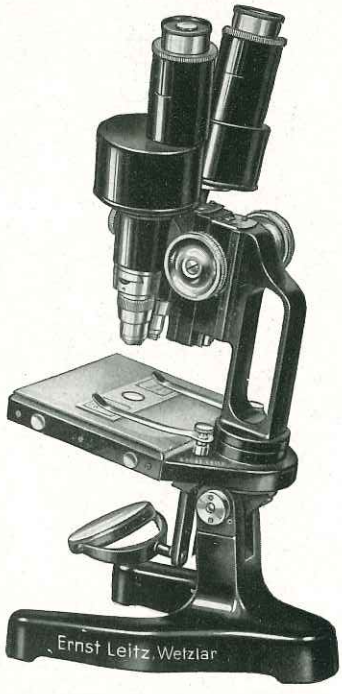


Fig. 20.

	Codeword
Greenough Stereo-Binocular Body with detachable intermediate adapter for the paired objectives from 2× upwards, but without objectives or eyepieces	**Green**
Interchangeable slide fitting with rack-and-pinion focusing motion	**Luzan**
Short interchangeable handle	**Logur**
Heavy black-lacquered metal frame with removable glass plate, with a changing device on the upper and one on the lower part of the frame. Can be used both as a **foot** (for incident light work) or, in conjunction with the microscope foot listed below, as an **object stage** (for transmitted light work)	**yeeaz**
Horseshoe type microscope foot, with joint, rotating and inclinable plane mirror, together with changing device for the attachment of the brass foot with removable glass plate (for transmitted light work)	**yeebn**
Fitted cabinet for accommodating the microscope . . .	**ykvee**
Outfit without optical components	**yeewx**

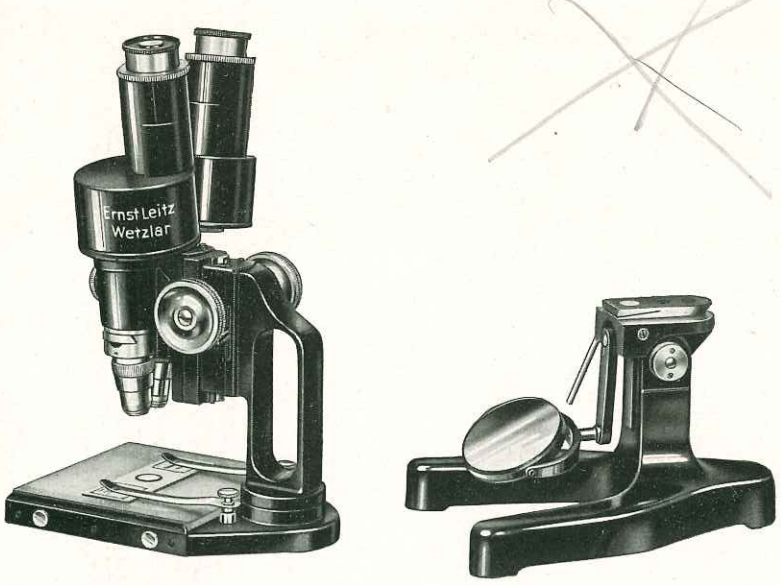


Fig. 21.

Or:

	Codeword
Greenough Stereo-Binocular Body with rapid changing device for 3 pairs of objectives, including one pair of objectives 1 × permanently mounted in the changer, movable by rack and pinion; without other paired objectives and eyepieces	**neeky**
Interchangeable slide fitting with rack-and-pinion focusing motion	**Luzan**
Short interchangeable handle, special type	**nfeeu**
Heavy black-lacquered metal frame with removable glass plate, with a changing device on the upper and one on the lower part of the frame. Can be used both as a **foot** (for incident light work) or, in conjunction with the microscope foot listed below, as an **object stage** (for transmitted light work); suitable for the Greenough body with rapid objective changer	**ymzee**
Horseshoe type microscope foot, with joint, rotating and inclinable plane mirror, together with changing device for the attachment of the brass foot with removable glass plate (for transmitted light work)	**yeebn**
Fitted cabinet for accommodating the microscope . . .	**yleem**
Outfit without optical components	**yneek**

Greenough Stereo-Binocular Microscope

with Illuminating Arrangement, on Pillar Stand.

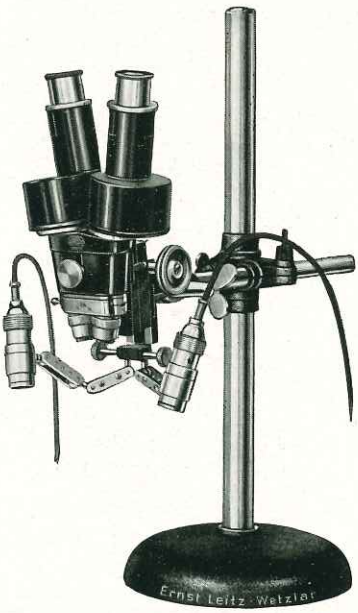


Fig. 22.

	Codeword
Greenough Stereo-Binocular Body with detachable intermediate adapter for the paired objectives from 2× upwards, but without objectives or eyepieces	**Green**
Interchangeable slide fitting with rack-and-pinion focusing motion	**Luzan**
Pillar stand with cross motion and double joint, on round iron base	**Lurte**
Incident Light Illuminating Arrangement, comprising two low voltage filament lamps 8 volts 0.6 amps. with converging lens, cord and daylight filter, with ball-jointed arm fitting the tube changing slide of the interchangeable rack-and-pinion motion	**Liminlolig**
For above:	
Regulating Resistance with ammeter, for connecting the illuminating arrangement to 110/220 volts A. C. or D. C.	**Rekey**
Case for accommodating the binocular body	**Greve**
Outfit without optical components	**yeexl**

Greenough Stereo-Binocular Microscope

on Cross Motion Stand UK II.

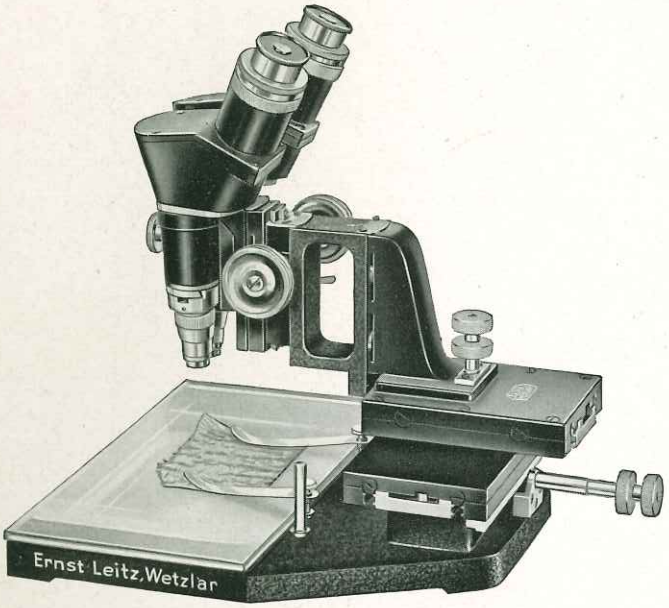


Fig. 23. Stand UK II with Greenough Body for incident light microscopy.

	Codeword
Greenough Stereo-Binocular Body with inclined eyepiece tubes, and with detachable intermediate adapter for the paired objectives from 2 × upwards, but without objectives or eyepieces	**yeesv**
Stand UK II with traversing range of 80 × 140 mm . . .	**cieew**
Intermediate fitting with dovetail slide	**dytee**
Interchangeable slide fitting with rack-and-pinion focusing motion	**Luzan**
Cabinet for accommodating the above	**cgeey**
Complete Outfit, without optical components	**yeezm**

Greenough Stereo-Binocular Microscope

on Cross Motion Stand UK IV.

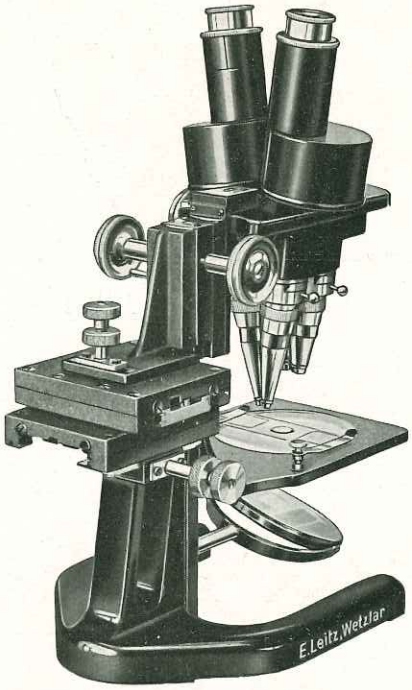


Fig. 24. Stand UK IV with Greenough Microscope Body with Rapid Objective Changing Device, for working with incident and transmitted light.

	Codeword
Greenough Stereo-Binocular Body with rapid changing device for 3 pairs of objectives, including one pair of objectives 1 × permanently mounted in the changer movable by rack and pinion; without other paired objectives and eyepieces	neeky
Stand UK IV with traversing range of 50 × 50 mm; object stage, vertically adjustable, with glass inset plate, together with plane mirror having an opal glass disc on the back	cleeu
Interchangeable slide fitting with rack-and-pinion focusing motion	Luzan
Cabinet for the above	ckeev
Complete Outfit without optical components	ygpee

"Lukam" and "Lucca" Camera Attachments

forming Photomicrographic Apparatus for the Prism Magnifier and the Greenough Microscopes.

Fig. 25.
Camera Attachment "Lukam" for plates 9 × 12 cm, placed on the Prism Magnifier.

With both cameras, the image is focused by means of the ground glass screen supplied. Each camera has a time and instantaneous shutter, and two metal dark slides.

To obtain suitable depth of focus, the objectives must be stopped down when the camera attachments are used with the prism magnifier. In the case of the high-power magnifier body, the diaphragm is slipped over the objective; in the case of the low-power magnifier body it is slipped in the mount of the objective.

	Codeword
Camera Attachment for plates 4½ × 6 cm, initial magnification approx. × ⅓, with intermediate fitting for self-winding wheel shutter for time and instantaneous exposures, 2 plate holders, one ground glass focusing screen, a wire release, together with 2 diaphragms for one objective of each of the two magnifier bodies; in case	**Lucca**
Camera Attachment for plates 9 × 12 cm, initial magnification × ⅔, otherwise as above	**Lukam**
Metal plate holder for plates 9 × 12 cm	**giikv**
Metal plate holder for plates 4½ × 6 cm	**giihu**

Large Drawing Apparatus

for use with the Binocular Prism Magnifier and the Greenough Microscope. (Enables the large field of view of the Binocular Prism Magnifier and the Greenough Stereo-Binocular Microscope to be fully utilized.)

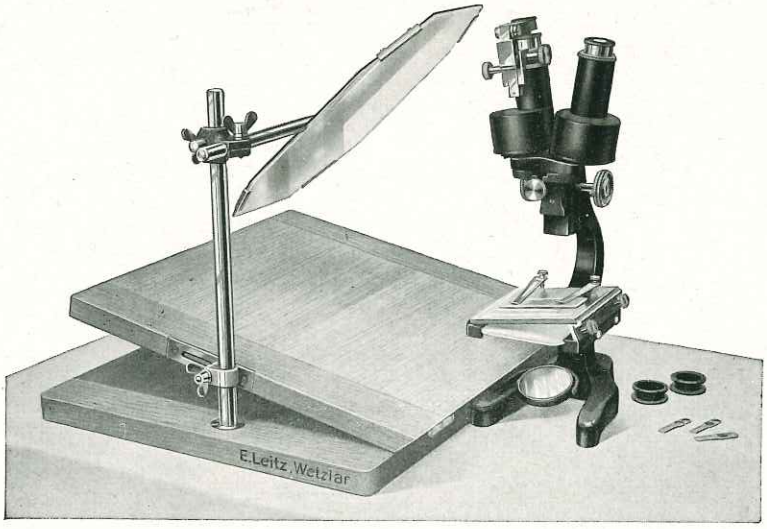


Fig. 26. Large drawing apparatus for large field of view, for the Binocular Prism Magnifier and the Greenough Stereo-Binocular Microscope.

	Codeword
Large Drawing Apparatus, comprising stand with drawing board with upper board inclinable to about 45°; with slip-in mirror 180 × 300 mm, four neutral glass discs in sliding mounts, ready for use for drawing with the binocular prism magnifier, including case which accommodates only the actual drawing apparatus, but not the drawing board or drawing mirror	**zeeog**
Intermediate collar for using the above drawing apparatus with the stereo-binocular microscopes with converging and parallel eyepieces	**zeeqh**
Full particulars are contained in our catalogue of Drawing Heads, etc., Micro D No. 7679.	

Objectives and Eyepieces

for the Greenough Binocular Microscope with Parallel Eyepiece Tubes (page 34).

Paired Objectives.

Initial Magnification	Focal Length mm	Free Working Distance mm	Micrometer Value measured with G12.5× and G18×	Codeword
2 ×	55	80	50 µ	nhees
3 ×	46	60	33 µ	nkeeg
4 ×	40	50	25 µ	nkgee
6 ×	30	35	16.8 µ	nleep
8 ×	25	26	13 µ	nliee
12 ×	18	18	8.6 µ	nmeeo
7 ×	25	22	—	nmlee

Paired Eyepieces with large field of view.

Notation and Magnification	G 8 ×	G 12.5 ×	G 18 ×
Focal Length mm	31.25	20	13.88
Codeword	npeel	npree	nqeek

Where desired, the right or left eyepiece of the various pairs may be supplied with a focusing eye-lens, to allow for differences in the sight of the two eyes. Additional cost for each pair of eyepieces . . **nqfee** (Codeword)

Eyepiece Micrometer, in mount, for placing in the eyepieces G 12.5 × or G 18 × . . . . . 10 mm = 100 divisions **ygeeq**
5 mm = 100 divisions **yheep**
10 mm = 200 divisions **ymeel**

Table of Magnifications, Free Working Distances and Diameters of Field of View.

Paired Objectives	Free Working Distance mm	Paired Eyepieces					
		G 8 ×		G 12.5 ×		G 18 ×	
		Magnif.	Field of View mm	Magnif.	Field of View mm	Magnif.	Field of View mm
2 ×	80	16	12	25	9	36	6
3 ×	60	24	8	38	6	54	4
4 ×	50	32	6	50	4.5	72	3
6 ×	35	48	4	75	3	108	2
8 ×	26	64	3	100	2.25	144	1.5
12 ×	18	96	2	150	1.5	216	1.0
7 ×*	22	56	3.4	88	2.5	126	1.7

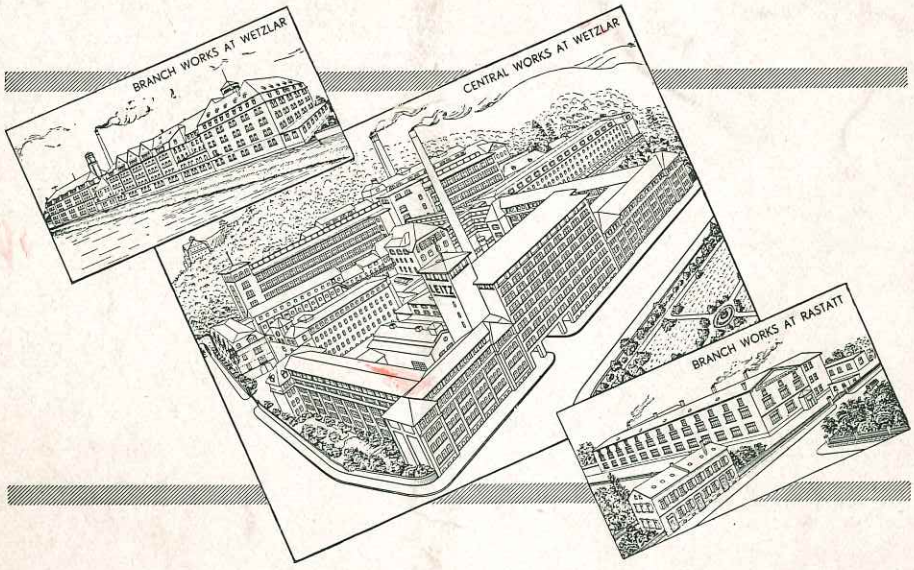
* Water immersion system.

Greenough Stereo-Binocular Microscope

with parallel eyepieces.

Fig. 27.

	Codeword
Interchangeable Binocular Body with parallel eyepiece tubes; without objectives or eyepieces	**nopee**
Interchangeable slide fitting with rack-and-pinion focusing motion	**Luzan**
Microscope stand with inclination joint, removable glass plate and ground glass and celluloid plates; two hand rests with supports, and movable plane and concave mirror	**Grest**
Fitted cabinet for accommodating the microscope . . .	**nreei**
Outfit without optical components	**yfeer**



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